

Pam. 628.41

"Organization of Public Sanitary Facilities in Communities", V. E. Bakutis, Lecturer, Technical Science Candidate, Authorized by the Ministry of Higher Education of the U.S.S.R. as an Academic Textbook in the Field of Municipal Construction and Administration, Publishing House of the Ministry of Municipal Affairs of the Russian Soviet Federated Socialist Republic, Moscow, 1956.

"Sanitarnoe Blagoustroystvo Gorodov", V. E. Bakutis, Dotsent, Kandidat Tekhnicheskikh Nauk, Dopushcheno Ministerstvom Vysshego Obrazovanuya SSSR v Kachestve Uchebnogo Posobiya Dlya Spetsial'nosti "Gorodskoe Stroitel'stvo i Khozyaystvo", Izdatel'stvo Ministerstva Kommunal'nogo Khozyaystva RSFSR, Moskva, 1956.

Translations of Portions of 312-Page Text
(from Russian) by:

John A. Kerr, Research Engineer,
Department of National Health and Welfare,
Public Health Engineering Division,
541 Federal Public Building,
Edmonton, Alberta, Canada.

LIBRARY
BOREAL INSTITUTE

JUN 26 1961

POLAR
PAM
4626

POLARPAM

"Organization of Public Sanitary Facilities in Communities", V. E. Bakutis, Lecturer, Technical Science Candidate, Authorized by the Ministry of Higher Education of the U.S.S.R. as an Academic Textbook in the Field of Municipal Construction and Administration, Publishing House of the Ministry of Municipal Affairs of the Russian Soviet Federated Socialist Republic, Moscow, 1956.

"Sanitarnoe Blagoustroystvo Gorodov", V.E. Bakutis, Dotsent, Kandidat Tekhnicheskikh Nauk, Dopushcheno Ministerstvom Vysshego Obrazovanuya SSSR v Kachestve Uchebnogo Posobiya Dlya Spetsial'nosti "Gorodskoe Stroitel'stvo i Khozyaystvo", Izdatel'stvo Ministerstva Kommunal'nogo Khozyaystva RSFSR, Moskva, 1956.

Translations of Portions of 312-Page Text (From Russian) by

John A. Kerr, Research Engineer,
Department of National Health and Welfare,
Public Health Engineering Division,
541 Federal Public Building,
Edmonton, Alberta, Canada.

1. General Sanitation.....	89
2. Sanitation of Public Buildings.....	91
3. Improved Dumping Grounds.....	96
4. Sanitary Checkers.....	105
5. Garbage Treatment in Networks and Networks.....	113
6. Incineration of Garbage.....	115
7. Plants for Sorting Garbage.....	118
8. Treatment of Manure and Livestock Carcasses.....	124
9. Sanitization Fields.....	126
10. Sanitary Fields.....	128
11. Waste Discharge Stations.....	135
12. Local Treatment of Wastes.....	144
13. General Principles Involved in the Selection of the System and Method of Waste Treatment.....	149

TABLE OF CONTENTS

<u>INTRODUCTION</u>	3
<u>CHAPTER 1 - COMMUNITY CLEANING - SOLID AND FLUID WASTES</u>	
1. General Concepts of Wastes and Community Cleaning.....	7
2. Classification, Composition and Characteristics of Community Wastes.....	9
3. Waste Quantities and Design Criteria.....	15
<u>CHAPTER 2 - COLLECTION AND REMOVAL OF HOUSEHOLD GARBAGE</u>	
1. Systems and Methods of Collection and Removal of Household Garbage.....	21
2. Indoor and Outdoor Garbage Cans.....	23
3. Transport Equipment and Organization of Work.....	30
4. Container System for Household Garbage Removal.....	41
5. Garbage Chutes in Residential and Public Buildings.....	45
6. Hydraulic System of Household Garbage Removal.....	56
7. Problem of Selecting the System and Method of Collection and Removal of Household Garbage.....	60
8. Dust Removal in Residential and Public Buildings.....	63
<u>CHAPTER 3 - COLLECTION AND REMOVAL OF FLUID WASTES</u>	
1. Methods of Collection and Removal of Fluid Wastes in Communities.....	66
2. Construction of Toilets and Waste Receptacles in Unserviced Areas.....	68
3. Removal of Fluid Wastes in Unserviced Areas.....	72
4. Public Lavatories.....	75
<u>CHAPTER 4 - INSTALLATIONS FOR THE TREATMENT OF COMMUNITY WASTES</u>	
1. General Concepts of Waste Treatment.....	89
2. Composting Wastes.....	91
3. Improved Dumping Grounds.....	96
4. Biothermal Chambers.....	105
5. Garbage Treatment in Hotbeds and Hothouses.....	113
6. Incineration of Garbage.....	115
7. Plants for Sorting Garbage.....	118
8. Treatment of Manure and Livestock Carcasses.....	124
9. Deodorization Fields.....	126
10. Sanitary Fields.....	128
11. Waste Discharge Stations.....	135
12. Local Treatment of Wastes.....	144
13. General Principles Involved in the Selection of the System and Method of Waste Treatment.....	149

CHAPTER 5 - CLEANING OF STREETS AND SQUARES

1. General Concepts of Street and Square Cleaning.....	151
2. Summer Street Cleaning.....	153
3. Organization of Summer Street Cleaning.....	162
4. Winter Street Cleaning.....	169
5. Organization of Winter Street Cleaning.....	179
6. Removal and Melting of Snow.....	186

CHAPTER 6 - ORGANIZATION AND PLANNING OF COMMUNITY CLEANING

1. Organization of Community Cleaning.....	195
2. Planning of Community Cleaning.....	198
3. Planning Stages and Characteristics from Design Data.....	199
4. Community Cleaning Installations and Vehicle Bases.....	202

CHAPTER 7 - COMMUNITY AIR POLLUTION

1. Community Air Purity Problems in the U.S.S.R.....	208
2. Air Pollution in Communities.....	211
3. General Evaluation and Criteria with Respect to Community Air Pollution.....	215
4. Safeguards of Purity of Community Air.....	218

CHAPTER 8 - COMMUNITY NOISE AND VIBRATIONS

1. Problem of Noise and Vibration in Soviet Community Construction.....	231
2. General Concepts of Noise and Its Measurement.....	232
3. Sources, Diffusion and Degree of Loudness of Community Noise.....	235
4. Methods of Reducing Community Noise.....	241
5. Building Vibrations.....	250

CHAPTER 9 - MANAGEMENT OF COMMUNITY WATER BODIES

1. Natural and Artificial Water Bodies in Communities.....	257
2. Sites for Swimming Pools and Beaches.....	259
3. Artificial Swimming Pools.....	267
4. Shower Pavillions.....	275
5. Management of Community Water Bodies.....	278
6. Planning and Engineering Problems with Respect to Anti-Malaria Measures.....	283

CHAPTER 10 - CEMETERIES AND CREMATORIES

1. General Concepts.....	290
2. Design and Operation of Cemeteries.....	291
3. Crematories.....	299

2. Design of Toilets and Waste Pits for Unserviced Areas

In unserviced areas fluid wastes are discharged into toilets and waste pits with separate or combined cesspits. The principal design requirements in this connection are ease of use and security against contamination of air, soil and water.

Peat toilets, ventilated toilets, and outdoor toilets are constructed in unserviced areas.

Peat Toilets Translations from Chapter 3 concerned with Toilets and Waste Receptacles in Unserviced Areas
 (finger) Toilets and Waste Receptacles in Unserviced Areas
 the toilet seat and which are carried out to be emptied. The special feature of this type of toilet is that peat or humus is placed on the wastes each time the toilet is used. The material for this purpose is stored in a number of boxes or in enclosed receptacles in the seat cover. The covering material absorbs fluids and eliminates odors. The necessary amount of covering material is determined from the criteria that from 0.3 to 0.8 kilograms of peat or from 1.4 to 2.0 kilograms of humus per person per day are required.

Peat toilets can be heated or unheated by installing them either in main buildings or annexes. They are only used in individual rural homes. The wastes are frequently used as fertilizer on sections of the rural lots. Peat toilets should be considered as a practical and permissible measure only until such time as waterworks and sewerage systems are constructed.

Ventilated toilets (fig. 43) are placed in a heated compartment and are provided with a ventilated cesspit built into the building. The cesspit is ventilated by a duct situated in the wall of the building and passing into the warm wall of the chimney from the furnace or stove. Such a system of ventilation prevents the odors from the cesspit from penetrating into the premises.

A single toilet compartment is made 0.9 meters wide and 1.2 or 1.4 meters long in plan.

Ventilated toilets have definite advantages over peat toilets and outdoor toilets. Warm flushing toilets, an integral part of a municipal waste collection system, are still more convenient, however.

The application of ventilated toilets is limited to individual rural dwellings and low-story buildings (one or two floors).

Outdoor toilets are unheated and non-flushing, are constructed away from buildings, and serve one or several dwellings. The toilet is located at distances of not less than 15 meters from dwellings and not less than 20 meters from wells.

When laying out residential zones or individual residences, it is recommended that outdoor toilets be located adjacent to wash-water receptacles and garbage cans.

An outdoor toilet is designed on the basis of one hole and one position at the urinating trough for from 15 to 18 persons. The space design criteria used are from 1.5 to 1.8 square meters per hole and from 0.75 to 1.0 linear meters per position at the urinating trough.

In our times outdoor toilets should only be constructed in residential zones or city regions where the construction of waterworks and sewerage systems has not yet begun; they are thus temporary structures used for short periods of time such as during the construction of dwellings, etc.

Washwater receptacles (fig. 44) have an aboveground section and a cesspit. When a mixture of slops and solid wastes are dumped into the receptacle the hatch is made from 0.7 to 1.0 meters long in plan and is provided with bars with openings of from 20 to 30 millimeters between the bars. The solid wastes which are left on the bars are placed in garbage cans. The cesspit and the aboveground section of the washwater receptacle are provided with an exhaust ventilation pipe. The washwater receptacle is placed from 12 to 15 meters from living quarters. The zone in which the washwater receptacle is situated is surrounded by shrubbery.

The wastes are removed together with sewage, or are used for moistening compost piles and for irrigating and fertilizing local kitchen gardens.

The cesspits for toilets and washwater receptacles may be constructed either as separate or combined units. When ventilated toilets are constructed, one cesspit can be used for two adjacent toilets in neighboring rooms. The cesspit is an underground receptacle with impermeable walls and bottom. It must also have an airtight hatch to permit proper ventilation via the chimney.

Old types of permeable cesspits built from logs, etc. should not be used in modern times as percolation of the fluid contaminates the soil and the groundwater; measures for placing a clay seal around and under the bottom of a cesspit do not always ensure its impermeability.

Impermeable cesspits are built from stone, brick, concrete or reinforced concrete. A cement solution is used for masonry work. The interior and exterior surfaces are also plastered with a cement solution. Concrete and reinforced concrete cesspits can be assembled from prefabricated elements.

When the groundwater table is high and when conditions are favorable for brick and stone masonry work, a clay lining from 0.35 to 0.50 meters thick is provided. The depth of the cesspit (below the surface of the ground) is made not more than 3 meters to permit convenient emptying. The access routes to cesspits and the areas around them are covered with an impervious material.

The volume of a cesspit for a toilet is determined from:

$$V = \frac{NQK_1}{nK_2} \quad (\text{cubic meters})$$

where

N - number of persons using the toilet;

Q - sewage storage design criterion, in cubic meters per person per year;

K_1 - ratio of maximum to mean values of sewage storage, taken as being from 1.25 to 1.30;

n - number of times cesspit is emptied per year;

K_2 - ratio of volume of cesspit to maximum volume of sewage in cesspit, taken as being from 0.80 to 0.85.

The fact that part of the liquid wastes are evaporated when the cesspit is ventilated should be taken into account; this is especially so in the case of the cesspits of ventilated toilets.

The volume of the cesspit of a washwater receptacle can be computed in an analogous manner. Its volume can be smaller than the volume calculated by the above formula, however, if the contents are used for irrigating kitchen gardens, fattening pigs, etc.

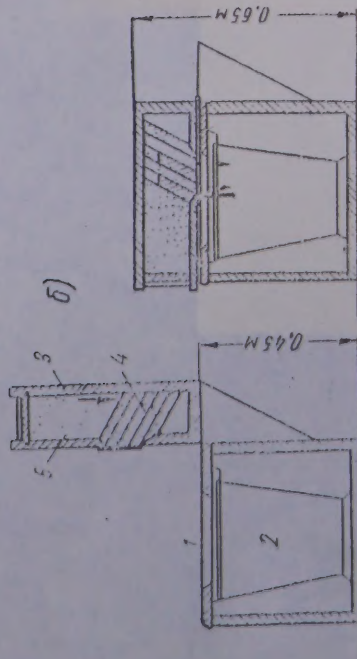


FIG. 42. Peat Toilet: a. Cover raised; b. Cover closed; 1. Toilet bowl; 2. Waste Receptacle; 3. Cover; 4. Automatic Peat Supplying Device; 5. Peat.

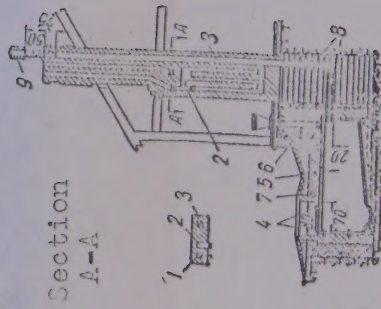


FIG. 43. Ventilated Toilet; 1. Chimney Flue; 2. Draft Flue from Kitchen; 3. Ventilation Duct from Cesspit; 4. Cesspit Hatch with Double Cover; 5. Cesspit; 6. Inlet Pipe; 7. Reinforced Concrete Cesspit Roof; 8. Cesspit Ventilation Pipe; 9. Deflector.

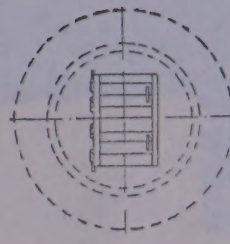
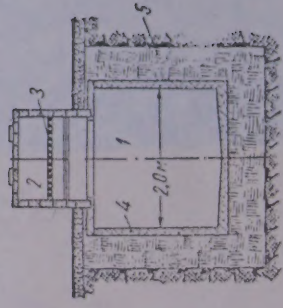
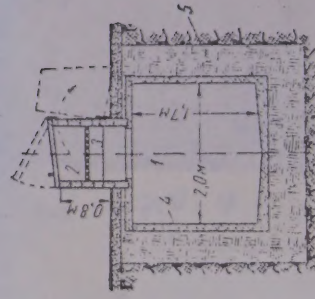


FIG. 44. Outdoor Waste Pit; 1. Cesspit; 2. Upper Ringed Section; 3. Screens for Retaining Large Objects; 4. Concrete Wall; 5. Clay.

[illegible]

APR 1984

JAN 29 79

4626

iii, 6p.

Orga

PAm 628.41

University of Alberta Library



0 1620 0336 7032